

### Supply Chain Optimization for Leaders

The Benefits and Approach to Optimizing a Supply Chain





# Introductions



# Workshop Objectives

- Introduction to a Constraints-Based approach of Supply Chain optimization
- Review key elements required for optimization of the supply chain
- Demonstrate the destabilizing effects of dependence, variation, lack of supply chain visibility and forecast inaccuracy
- Provide an understanding of the Supply Chain Optimization process



### The MEP Network

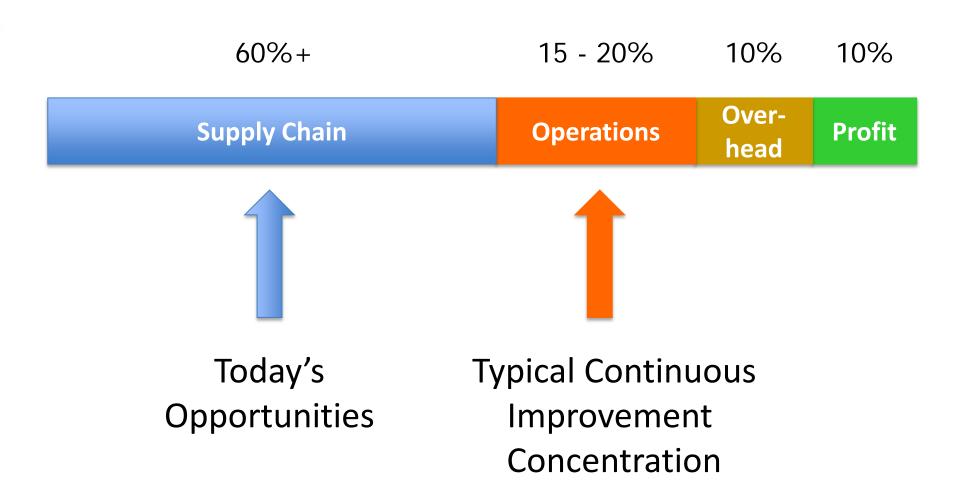


The National Institute of Standards and Technology's Manufacturing Extension Partnership (MEP) Centers





# Why Optimize the Supply Chain





### Supply Chains Need Assistance in 12 Areas

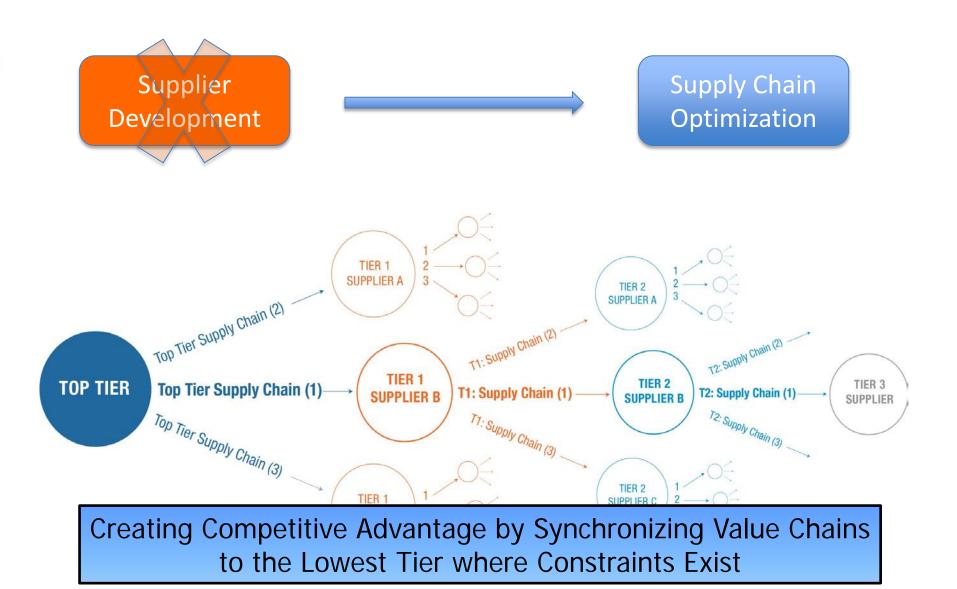
- 1. Make better Total Cost of Ownership decisions
- Increase effectiveness of ERP/MRP
- 3. Mitigate global risks
- 4. Reduce/manage volatility
- Expand supplier matching capabilities to source for emergent needs
- Improve OEM/Supplier product development collaboration
- Document supply chain strategy
- 8. Align supply chain metrics with long-term business focus
- 9. Identify and address choke points in a sustainable manner
- 10. Optimization of the supply chain
- 11. Recognize the emergent needs for future capabilities and technology
- 12. Enhance value chain collaboration among suppliers, OEMs, and customers



U.S. Supply Chain Competitiveness Study



# Focus: Optimizing Entire Supply Chain





# Supply Chain Optimization Roadmap

Strategy Development



Coaching,

Mentoring,

Directing

### Strategy **Implementation**



Mentoring,

Directing

### **Partner** Engagement



Coaching, Mentoring,

Directing

### **Partner Deployment**

#### **Develop/Enhance Strategy:**

- Evaluate Current Supply Chain Maturity
- Apply Constraint Theory Concepts
- Identify Supply Chain Challenges
- Evaluate Innovation and Sustainability Objectives
- Establish Supply Chain Strategic Objectives
- Align with Organizational Objectives
- Create Supply Chain Strategy Deployment Plan

### **Deploy Strategy:**

- Develop Supply Chain Risk Management Plan
- Implement TCO Methodology
- Align Supplier Performance Metrics with Supply Chain Strategy
- Assess Supply Chain Visibility
- Identify Supply Chain Constraints
- Develop Supply Chain Communication and Collaboration Plan

### Coaching, **Communicate Strategy:**

- Share Strategic Objectives
- Communicate Supply Chain Performance Metrics
- Align Organizational Objectives with Supply Chain Performance Metrics
- Establish Constraints Theory Concepts
- Identify Opportunities for Collaboration
- Create Supply Chain **Optimization Plan**

### **Implement Improvements:**

- Assess Supplier Maturity
- Align Lead Time, Capacity and Quality Systems
- Integrate Performance Measurements
- Improve System Visibility
- Enhance Collaboration
- Deploy Risk Mgmt Practices
- Implement TCO Methodology
- Implement Sustainability Initiatives
- Evaluate Next Tier Suppliers
- Apply Strategic Sourcing
- Extend Network Diagram
- Optimize Flow

Alignment

**Visibility** 

Collaboration

**Optimization** 

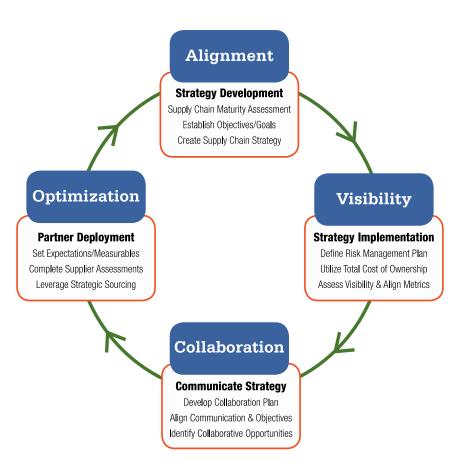


### Competitive Edge

Competition is no longer between companies, it's between supply chains. The volatile economy means that manufacturers have to be much more agile, flexible, and responsive to external pressures.

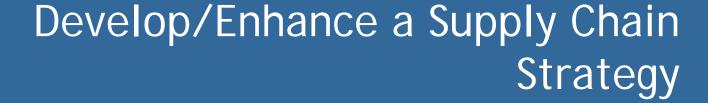
Those with optimized supply chains experience benefits like:

- Lower Costs
- Better Delivery
- Increased Quality
- Competitive Edge





# Strategy Development



#### Strategy Development



#### Develop/Enhance Strategy:

- Evaluate Current Supply Chain Maturity
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#### Strategy Implementation





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#### Partner Engagement

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Alignment

Visibility

Collaboration

Optimization

# Strategy Development

Strategy Development



Coaching, Mentoring, Directing

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### **Development Outcomes:**

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### Establish Strategic Objectives: Supply Chain Maturity Assessment

Online 18 question assessment of supply chain maturity. Examples:

### **Strategic Fit**

- Does your firm have a current documented supply chain strategy that is a component of its overall corporate strategy?
- Has your company redefined the supply chain as a value delivery system, clearly identifying the significant contributors from the customer to the lowest level provider?
- Are you managing your supply chain holistically rather than just managing individual components of your Supply Chain?

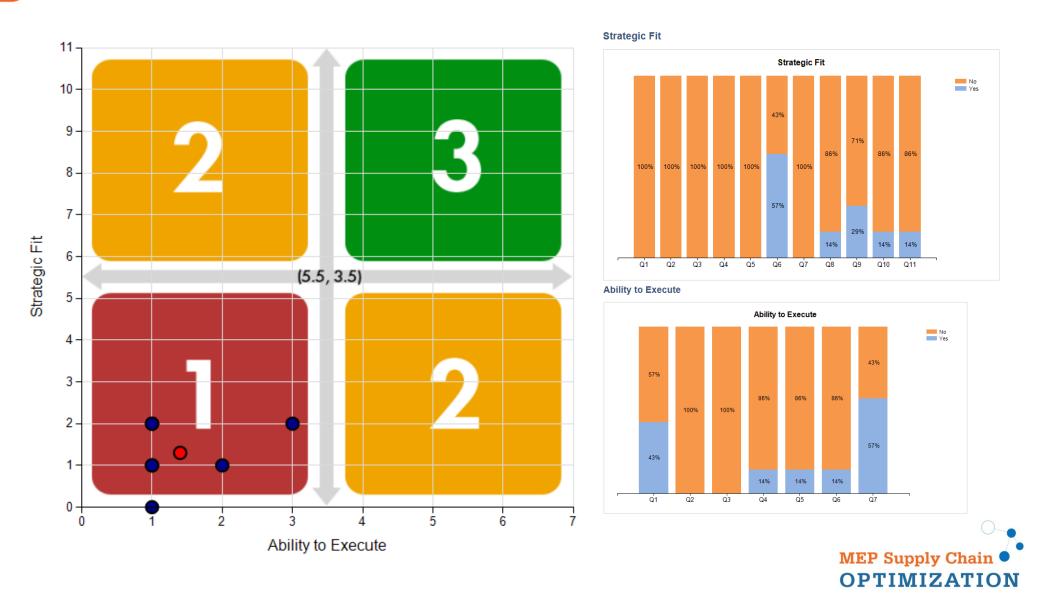
### **Ability to Execute**

- Does your company invest more money than necessary in low return, low impact areas?
- Does your company have an enterprise information system that is integrated with your supply chain member's information systems?
- Does your company have demand visibility from the customer down to the lowest tier supplier?

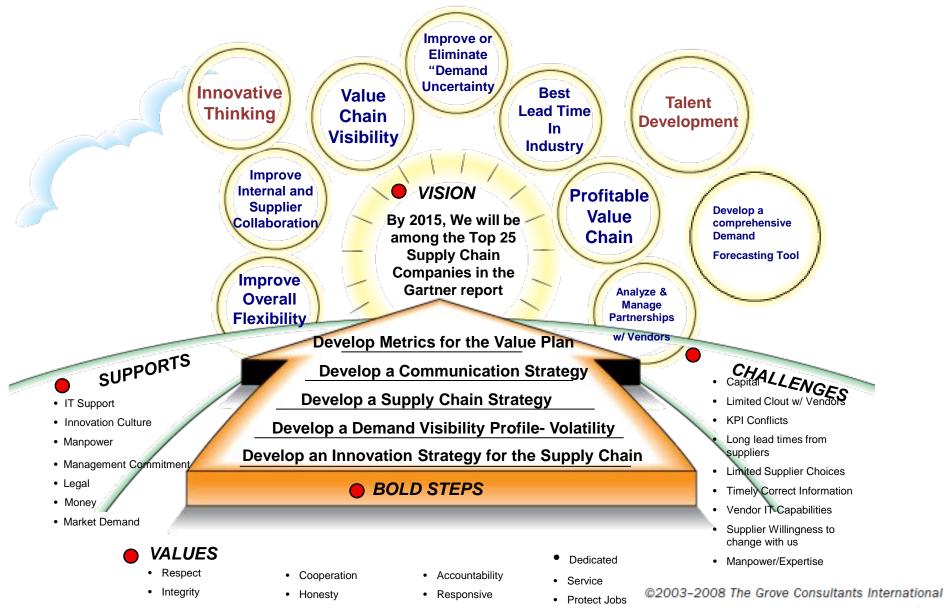
OPTIMIZATI

### Establish Strategic Objectives: Supply Chain Maturity Assessment

### Strategic Fit vs. Ability to Execute

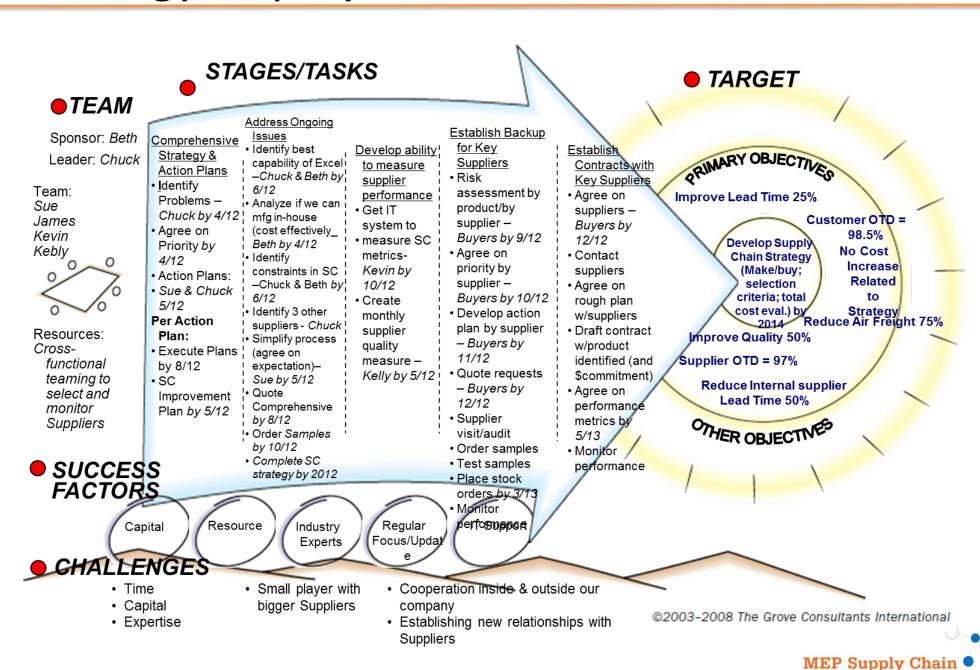


# Establish Strategic Objectives: 5 Bold Steps





# Strategy Deployment: The Game Plan



**OPTIMIZATION** 

# **Strategy Development Session**















# Internal Strategy Implementation



# Plan and Implementation the Supply Chain Strategy

Primary Strategy Development



#### **Development Outcomes:**

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Strategy Implementation

Implementation

Develop Supply Chain Risk

· Implement TCO Methodology

Align Supplier Performance

Metrics with Supply Chain

Management Plan

Assess Supply Chain

Identify Supply Chain

Develop Supply Chain

Communication and

Collaboration Plan

**Outcomes:** 

Strategy

Visibility

Constraints



#### Supply Chain Partner Development



### Partner Development

### Outcomes: • Share Strategic Objectives

- Communicate Supply Chain Performance Metrics
  - Align Organizational Objectives with Supply Chain Performance Metrics
  - Establish Constraints Theory Concepts using Simuation-Based Learning
  - Identify Opportunities for Collaboration
  - Create Supply Chain Optimization Plan

Partner Strategy Implementation

#### Partner Implementation Outcomes:

- Assess Supplier Maturity
- Align Lead Time & Capacity
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- Deploy Risk Management Practices
- Implement TCO Methodology
- · Evaluate Next Tier Suppliers
- Extend Network Diagram

Executive Engagement Implementation Planning Partner Engagement Supply Chain Optimization



### Internal Strategy Implementation

Strategy Implementation



oaching,

Mentoring, Directing

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Visibility

### Implementation Outcomes:

- Develop Supply Chain Risk Management Plan
- Implement a Total Cost of Ownership (TCO) Methodology
- Align Supplier Performance Metrics with Supply Chain Strategy
- Assess Supply Chain Visibility
- Identify Supply Chain Constraints
- Develop Supply Chain
   Communication and Collaboration
   Plan



# Network Diagram and Constraining Suppliers

Strategy Implementation



Mentoring,

Directing

#### **Deploy Strategy:**

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Visibility

### **Develop Network Diagram**

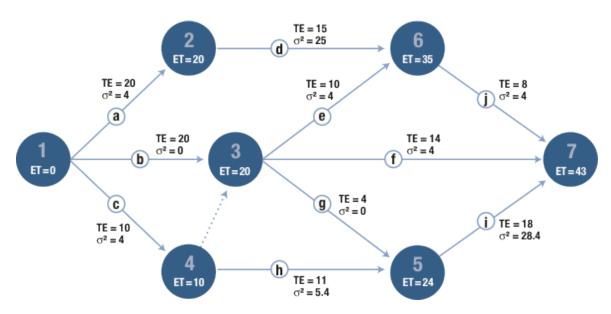
- Identify your Supply Chain members for a particular product line or family
- Collect performance data for each member
- Map out the suppliers in terms of a Value Chain/Stream

### **Identify Constraining Suppliers**

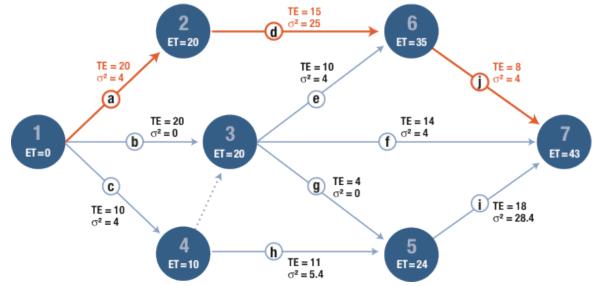
- Per the performance data, note suppliers that are not meeting the performance criteria
- Hone in on suppliers that are crucially constraining the supply chain



# Supplier Network Map with Constraint



PERT analysis is used to identify constraints with regards to lead time and variation.
This focuses where to expend efforts.





# Deploy Risk Management Practices

Strategy Implementation



Coaching,

Mentoring,

Directing

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Visibility

### **Deploy Risk Management Practices**

- Benefits of Implementing a Risk Management Program
  - Identify, Assess, Manage and Monitor the Supply Chain Risks
  - Quantify "cost" of Risks
  - Understand significance/severity of risks
  - Reduce occurrences and impacts of risks
  - Promote organizational behaviors focused on risk management
  - Increase effectiveness of product and service delivery to customer



# **Supply Chain Risks**

	2014	,,,,,	2013 Rank <b>Trend</b>
02	1 Business interruption, supply chain risk	43%	46% (1)
<del>.</del>	2 Natural catastrophes (for example, storm, flood, quake)	33%	44% (2)
Sky	3 Fire, explosion	24%	31% (3)
ş	4 Changes in legislation and regulation	21%	17% (4)
$\rightarrow$	5 Market stagnation or decline	19%	12% (8) 🐬
7	6 Loss of reputation or brand value (for example, from social media)	15%	10% (10) 🐬
*	7 Intensified competition	14%	17% (5)
ž.	8 Cyber crime, IT failures, espionage	12%	(-) (-) NEW
<b>1</b> %	9 Theft, fraud, corruption	10%	(-) (-) NEW
C	10 Quality deficiencies, serial defects	10%	13% (6)



# Identify and Evaluate the Supply Chain Risks

Strategy Implementation



oaching, Mentoring, Directing

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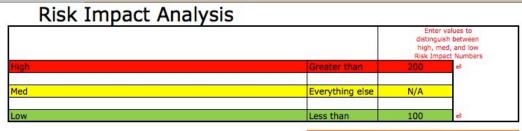
Visibility





### The Risk Workbook Tabs





Enter Data in Orange Cel

Risk Category					"IF - THEN" Risk Statement	Probability	Detectability	Severity	Risk Impact Number	Probability %
Logistics		ass panel cost includ sensitive to increase	es component for deivery and s in fuel cost		increase 5% or more then supplier will panels to compensate	9	4	6	216	90%
Supplier Performance		ere has been a probortly after installation	olem with photovoltaic cells n		rly, warrantee replacement costs will nargin and erode customer confidence	3	5	8	120	30%
Glass panel supplier is currently in contract				If glass panel	supplier goes on strike it could result in ortages and inability to fill orders	2	4	4	32	20%
Capacity		anual lamination products	cess is time consuming and is		lacking then the increase in the manual ocess will cause late orders	8	4	5	160	80%
Legal	Installers could potentially cause roof leaks resulting				rors result in leaks in customer's roof, amage inventory at customer facility	5	6	8	240	50%
1	roof leaks resulting in liti damage and inventory lo customer location				in customer's roof, leaks could damage inventory at customer facility	Report of				

18 19 20 5/28/14

IEP Supply Chain
OPTIMIZATION

### The Risk Workbook Tabs

### Risk Response Register

1000		Enter values to distinguish between high, med, and low RPNs
High	Greater than	200
Med	Everything els	N/A
Low	Less than	100

Enter Data in Orange Cells

	Enter the mitigation strategy, trigger, fallback strategy, & owner's contact information											
	Risk Category	Risk Description	"IF - THEN" Risk Statement	Risk Impact Number	Risk Mitigation Strategy	Trigger	Trigger Activated Y/N	Fall Back	Risk Owner Contact Info	Trigger Activated Date	Due Date	Notes
1	Logistics	Glass panel cost includes component for deivery and is sensitive to increases in fuel cost	If fuel prices increase 5% or more then supplier will raise cost of panels to compensate	216	logistics suppliers	Fuel prices increase 5% over contract base	Υ	Identify alternative suppliers	Emily Pearson (515) 755- 0107	5/1/14	5/30/14	Contract discussions are underway with 3 logistics providers.
2	Supplier Performan ce	There has been a problem with photovoltaic cells shortly after installation	If cells fail early, warrantee replacement costs will lower profit margin and erode customer confidence	120	advanced	Failure rate exceeds 1%	N	Identify alternative suppliers	Bob Davis (515) 755- 0110			Continue monitoring
3	Labor	negotiations with labor	If glass panel supplier goes on strike it could result in inventory shortages and inability to fill orders	32	capacity at alternate glass	Labor negotiations exceed 3 weeks	N	Identify alternative suppliers	Jill Samson (515) 755- 0100			Continue monitoring
4	Capacity	Manual lamination process is time consuming and is limited by line capacity	If capacity is lacking then the increase in the manual lamination process will cause late orders	160	lamination cell to handle increases in	Order volume increases more than 20%	N	Implement automated production line	Emily Pearson (515) 755- 0107			Continue monitoring
5	Legal	leaks resulting in	If installer errors result in leaks in customer's roof, leaks could damage inventory at customer facility	240	Redesign installation kit and develop installer qualification program	Report of roof damage	N	Develop installation kit with non- penetrating attachment	Ron Jones (515) 755- 0102			Continue monitoring



# Implement TCO Methodology

Strategy Implementation



oaching, Mentoring, Directing

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Visibility



**OPTIMIZATION** 

# Implement TCO Methodology

Strategy Implementation



Coaching,

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Visibility

**Implement TCO Methodology** 

- Benefits of Using TCO
  - Provides knowledge of both visible and hidden costs
  - Understand the true cost of sourcing decisions
  - Allows better operating and financial trade-off decisions
  - Can provide an assessment of ecological and social costs

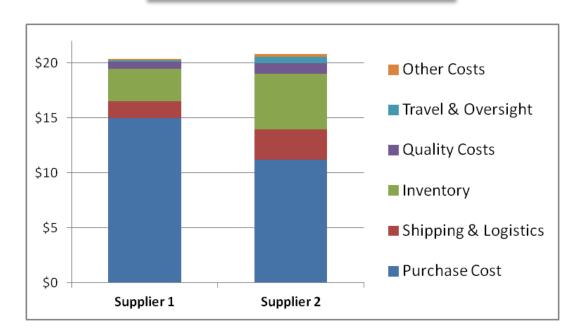


# "Traditional" vs. TCO Decision Making

Purchase Cost Only

### Total Cost of Ownership

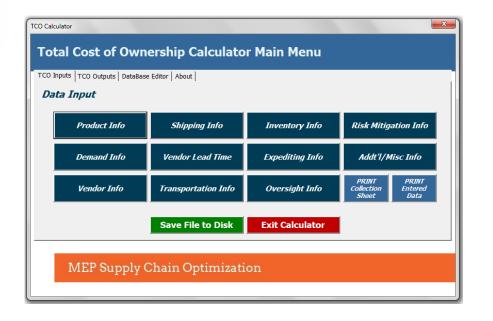




TCO Provides a More Complete & Competitive Measurement of Both
Direct and Indirect Acquisition Costs to Aid in Strategic Sourcing Decisions



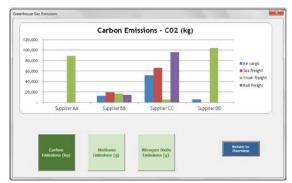
# The TCO Calculator™













# Partner Strategy Collaboration



# Communicate the Supply Chain Strategy

Primary Strategy Development



### Development Outcomes: Implen

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Strategy Implementation



#### Implementation

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Supply Chain Partner Development



### Partner Development Outcomes:

- Share Strategic ObjectivesCommunicate Supply Chain
- Performance Metrics

   Align Organizational
  Objectives with Supply Chain
  Performance Metrics
- Establish Constraints Theory Concepts using Simuation-Based Learning
- Identify Opportunities for Collaboration
- Create Supply Chain
   Optimization Plan

Partner Strategy Implementation

#### Partner Implementation Outcomes:

- Assess Supplier Maturity
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- Extend Network Diagram

Executive Engagement Implementation Planning Partner Engagement Supply Chain Optimization



# Partner Strategy Collaboration

#### Partner Engagement



#### Communicate Strategy:

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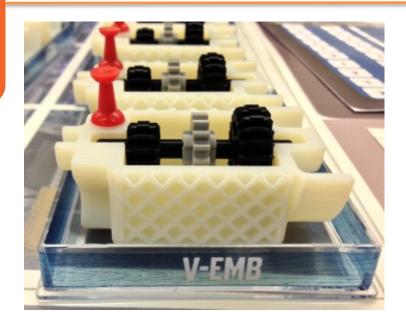
Collaboration

### **Partner Collaboration Outcomes:**

- Share Strategic Objectives
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# Supplier Communication Event: S4Lean™





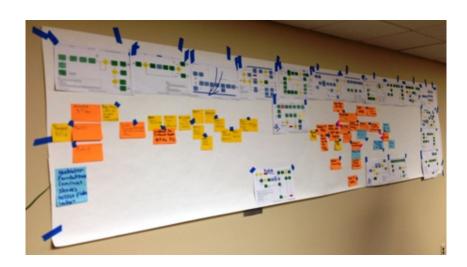


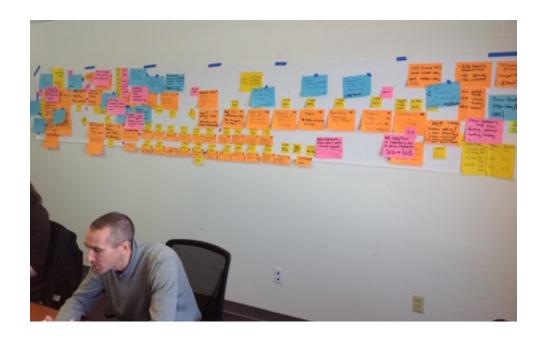




# Supplier Communication Event: VSM







Collaborative Value Stream Mapping



### **Supplier Communication Event**

### **Outcomes:**

- Educate your suppliers on the supply chain strategy and how they fit
- Train the supplier on synchronous communication
- Build Trust
- Develop desire of the suppliers to improve network execution:
  - Lead Time
  - On Time
  - Quality
  - Total Cost
  - Risk Management



# Partner Strategy Implementation



#### Primary Strategy Development



#### **Development Outcomes:**

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#### Strategy Implementation





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Executive Engagement Implementation Planning

**Partner** Engagement Supply Chain Optimization



# Partner Strategy Implementation

#### Partner Deployment

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Optimization

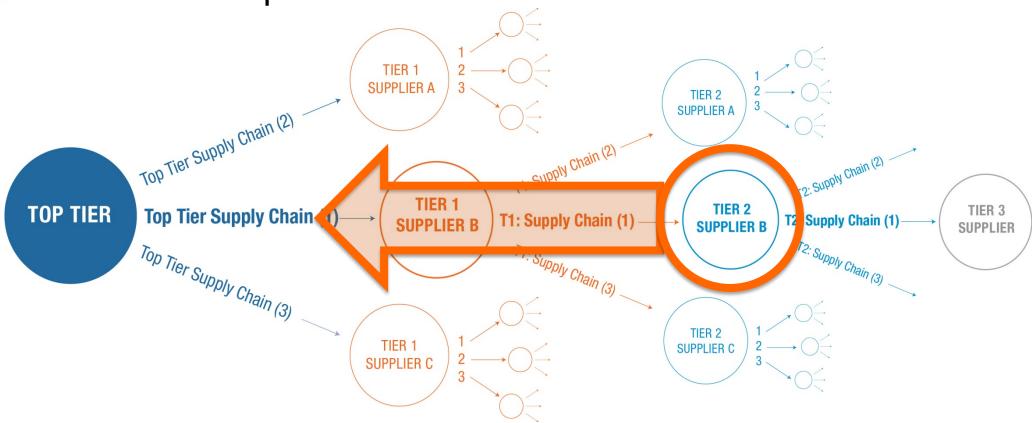
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## The Drive for Optimization

Suppliers can use SCO to make themselves more attractive partners





# Supply Chain Optimization

Why Undergo Optimization?



# Supply Chain Costs Across Industries

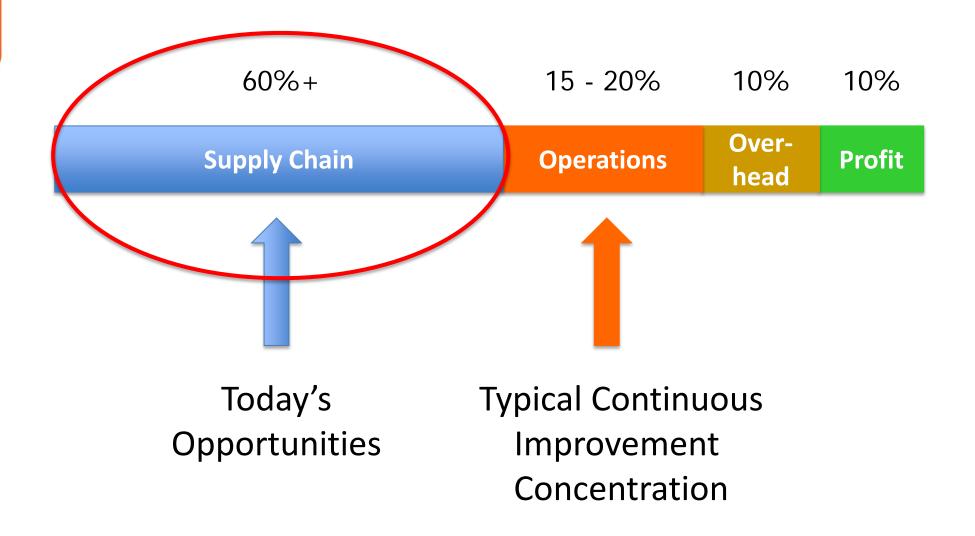
### Supply Chain Costs as a Percent of Sales \*

Industry	% Purchased
All industry	52
Automobile	67
Food	60
Lumber	61
Paper	55
Petroleum	79
Transportation	62

\*(APICS study 2009)



# Why Optimize the Supply Chain



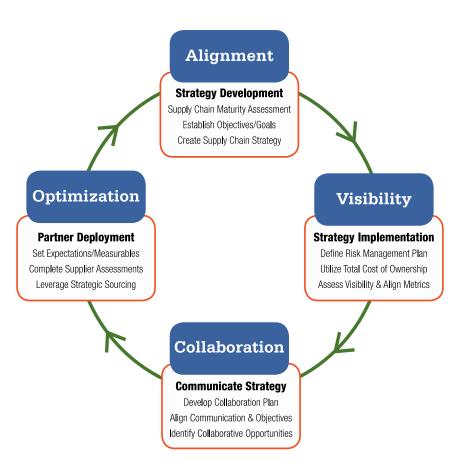


### Competitive Edge

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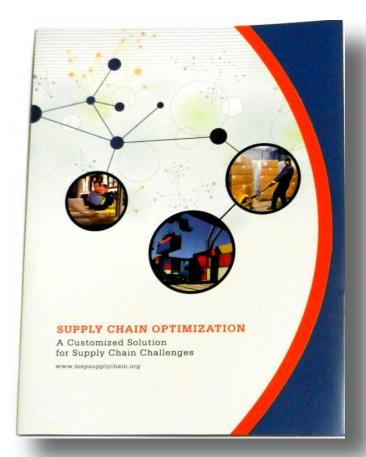
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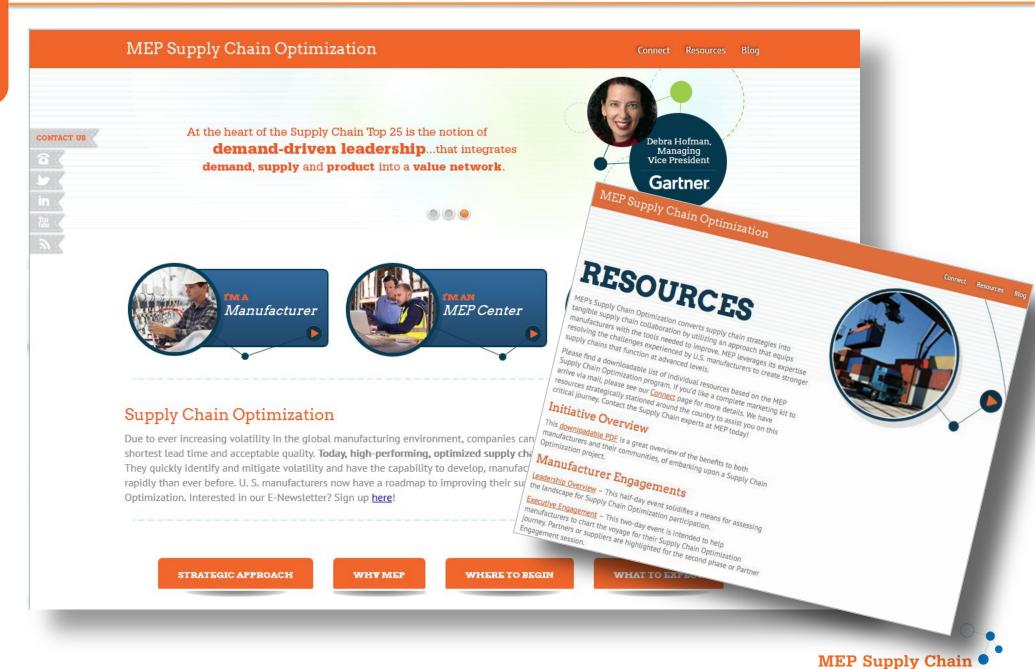
### More Information - The MEP SCO Folder







# SCO Website – www.mepsupplychain.org



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### Information Sharing - SCO Blog and eNewsletter



#### New Hampshire to Host Supply Chain Optimization Event



#### Supply Chain Strategy Leadership Overview

Assessing the Landscape

Date: June 4, 2014 Time: 8:30 a.m. - 12:30 p.m.

Location: Best Western PLUS, 13500 S. Willow St. Manchester, NH 03103

Cost: Complimentary, No Charge Event

This overview is intended to demonst... Read More

#### The Advantages of a Short, Sustainable Supply Chain



#### By Gray Rinehart

Long before I ever heard the terms "supply chain" or "sustainability" — when I was fresh out of college, and before I went on active duty in the Air Force — I worked for a factory that had and still has one of the shortest an... Read More

#### ISO 9001:2015 Revision - Things Could Get Risky



What you need to know about the ISO 9001:2015 Revision
ISO 9001 has been the quality management standard, with almost 1 million
businesses certified around the world, according to American Society for Quality.
ISO has had many revisions including, 1994, 2000, and 2008 vers... Read More



### How Understanding Customers Can Strengthen Your Supply Chain

Excerpted from PNC's Business Insights, David Boulay, Ph.D., talks of how the Manufacturing Extension Partnership provides a roadmap for manufacturers to create more dynamic, customer-focused supply chains

I'm of the belief that supply chain discussions don't always have to be "doom and gloom." Manufacturers are well aware of the negative aspects of the lack of a supply chain strategy. With ramifications of productivity losses, supplier failures or the inability to react to adverse events, manufacturers understand that the lack of a plan has many consequences. But perhaps it leads to opportunities, too; one in particular brings us even closer to the customer - Read more



#### Upcoming MEP Events

TCO Workshop (public) TriCounty Technical College SCMEP

Pendleton, South Carolina

#### 5/02/14

TCO Workshop (public) SCMEP Business Learning Center Greenville, South Carolina

Tweet To Sha

Share



# Social Media - Twitter and LinkedIn





# A Network of Support

### Manufacturing Extension Partnership (MEP) Centers





## A Sample of Companies Involved in MEP SCO





















VOLVO





































### **Engagement Testimonials**

"MEP has developed an interactive workshop focusing on the "Theory of Constraints" approach for supply chain management. With a very talented group of lean professionals on our team we had in-depth discussions and learned to look at the continuous improvement topics from a different perspective. Our team has already begun implementing new knowledge into existing programs; the two day workshop has already helped recalibrate the way we think and act."

Joerg Klisch, VP Operations North America Tognum America



"MEP has put together an intelligent program that was well thought out and challenging for supply chain management team. They challenged our supply chain approach and current paradigm – forcing us to take a fresh look at what we do and how we do it. We are using the supply chain strategy tools that they provided as "take-aways" to change how we do things."

Bruce Broxterman, President Richards Industries



"The two day workshop is jam packed with theory, class exercises, real life examples and interactive discussion. Our entire team was involved and challenged, and we came away with a very workable road map on how to improve our Supply Chain. Overall, the program was well worth our investment."

John King, North American Food Equipment Dir. Sealed Air Corporation





# Questions



